

same reason BN^2 , BG^2 , BE^2 , BA^2 ; but BE^2 = BN^2 , and consequently BA^2 = BG^2 , so that the truth of the construction is obvious.

There are many practical cases in which these problems, in reference to the multiplication and division of squares, may be very usefully applied, especially by those who are not conversant with the operation of extracting the square root in numbers; but even in cases where the operator is perfectly familiar with the numerical process, the geometrical delineation is to be preferred, as being more convenient for ultimate purposes; it is therefore, in these and similar cases, that the constructions which we have given above will find their application, and when the process is performed with care and with good instruments, the results may always be obtained with a sufficient degree of accuracy for every practical purpose. And moreover, the ease and facility with which the construction is effected, is a high recommendation of this method of resolving the problems, for in every instance the whole process is performed without the slightest degree of mental exercise beyond the necessary attention required in using the instruments.

TRIAL OF THE DEE BRIDGE GIRDER.

Our own correspondent writes from Chester as follows:—After waiting patiently for some weeks, the fellow girder in the one broken by the accident at the Dee-bridge has been tested, and the result proves the correctness of the evidence of Messrs. Robertson, Robe, and others, and the verdict of the jury.

The proof took place early in the morning of the 8th instant, and was witnessed only by the officers of the Chester and Holyhead Railway Company, no one connected with either the Shrewsbury and Chester Railway Company, or the City of Chester, being present on the occasion.

It was generally thought, from the time that had elapsed since the girder was removed from the bridge and placed upon the temporary supports on the Saltney abutment, that it was waiting the inspection and test of a Government commission (which we observe has only just been appointed by her Majesty), but it is presumed that as they entertained doubts upon the strength of the girder themselves, the proof took place on the eve of the appointment of that commission. It was accomplished with railway bars (seventy-five tons having been brought to the spot for that purpose) suspended from the girder, and the weight was gradually applied and equally distributed over the centre division of the rib (each girder, as our readers are aware, being composed of three divisions or castings), until it reached 38 tons 6 cwt. 2 qrs. 18 lbs., under which it broke. The fracture commenced at the bottom flanges, and proved clearly that it broke by tension. This experiment at once shews the fallacy and utter uselessness of the tension bars in the manner in which they were applied at this bridge.

It is a remarkable circumstance, that notwithstanding the host of engineering talent brought forward to support the theory of the *side blow* asserted with so much earnestness to be the cause of the accident, and which from the support it received had nearly carried conviction to the minds of the coroner and jury, no attempt has yet been made to protect the remaining ribs from similar calamitous *side blows*, but piles have been driven in the bed of the river Dee to support the roadway underneath, from which circumstance we will leave our readers to draw their own conclusions.

The same thing has been done at the bridges on this principle on the Trent Valley Railway. It must be admitted that the works of the Chester and Holyhead Railway are executed in a very unsatisfactory manner, for in addition to the bungling at the Dee Bridge, which "bungs Banagher," they are now taking down the girder-bridge over the Chester and Ellesmere canals of 60 feet span, in consequence of some fractures being observed in the masonry at the quoins of the abutment upon which the outside girders rest. The abutments of this bridge are composed of the very soft red sandstone of the district, which is totally unsuited for works that are intended to be of a strong and substantial character, so a mere casual inspection of many of the public buildings of Chester amply testifies.

We warn the Government to see that the works of this railway are minutely inspected by shrewd practical civil engineers, before the opening of the line (as from these two failures we may fairly infer it is urgently required); their responsibility will be great should another catastrophe similar to the Dee bridge accident occur, and it is not a mere superficial inspection, such as generally takes place before the opening of railways, that will satisfy the public mind in this case, even if it ought to do so in others. The numerous accidents that occur from the defective works of railways, require greater vigilance on the part of the Government, if not legislative interference.

ART FOR THE PEOPLE.

CONSIDERABLE improvements are going on in Windsor Castle, and it is understood that, at the request of her Majesty, a further portion of the palace will be opened on the public days, including many fine works of art not now exhibited.—There is no doubt that the rumour which we first announced, that the paintings in Buckingham Palace will be opened to the public on certain days is correct.—On Friday last including the evening, more than 17,000 persons visited the Art-Union of London Exhibition, without the occurrence of a single accident or injury. The crowding was, of course, very great, and the officers of the society had hard work for many hours in keeping back the visitors and admitting them in detachments, as others left the rooms by another way. This would be avoided if the subscribers would avoid postponing their visit till the last week. For the first fortnight during which the exhibition was open, the rooms were comparatively clear. The various works of art have since been taken away by their respective owners, and the rooms are being fitted up for the schools of art about to be established by the Society of British Artists.

The fine exhibition of paintings in Westminster Hall is drawing to a close, and fears are entertained and loudly expressed, lest no further opportunity of exhibiting their productions should be afforded to the body of artists called into being by the proceedings of the royal commissioners. We understand that the council of the Art-Union of London have been solicited, as a neutral body associated for the promotion of the arts, to aid in organizing a biennial or triennial exhibition, with the view of preventing this.

PRESENT STATE OF THE PARTHENON.

MR. G. KNOWLES has recently published a plan of the Parthenon, on a scale of 50 feet to 3 inches, shewing its actual state with great minuteness, and particularly the ichnographic disposition of the columns of the interior not before given. In 1842 the Archaeological Society of Athens removed the mosque which, during many years, had occupied the greater part of the cella of the Parthenon, and the internal arrangement of the columns became evident by unquestionable indications on the paving. "It appears," says Mr. Knowles, in a page of letterpress accompanying the plan, "that the axes of the columns were placed upon the joints of the slabs composing the pavement, precisely according to the system observed in the interior peristyle of the temple itself. It is conjectured that the angles were supported by pilasters, as well from the evidence of a corresponding one actually existing in the south-eastern end of the cella, as from the requirement of the intercolumniation: but it must be stated, that no distinct traces of such pilasters have been discovered."

The plan gives the measurement of every piece of the pavement remaining, and all "marks and indications upon the surface of the plan of the temple, which might, by possibility, assist the future investigation of these precious remains."

CEMETERY FOR THE ARMY AND NAVY.—A grand cemetery for the officers of both services on Shooter's Hill (appropriate site) is talked of.

* Ground Plan of the actual state of the Temple of Minerva at Athens. By George Knowles. G. Bell, Fleet-street.

PURCHASE OF SHAKESPEARE'S HOUSE.

On Thursday, the 16th, the long-talked-of sale of the reputed birth-place of the "myriad-minded" man, Shakspeare, took place. The lower room was crowded long before the time appointed for business, and a move was made to an apartment upstairs, where, by the time Mr. Robins entered the rostrum, every corner was filled, including the lobbies and landings outside. After the auctioneer had read the particulars and made some preliminary observations, including replies to questions which were raised first as to its being in truth the poet's birth-place, and secondly as to the goodness of the title, 2,000*l.* were bid. A paper was then handed to the auctioneer, which after some hesitation he read, containing an offer of 3,000*l.* from the United Stratford and London Committee, made, it was stated, under a feeling of the duty imposed on them, and for which amount they must look to the public, the present subscriptions being quite inadequate. After a pause, somewhat exciting, the auctioneer said the trustee, before entering the room, had reserved to himself the right of making one bid; he was now authorized to say the trustee would make no bidding: so after waiting a certain time, to give any individual who wished to advance the opportunity of doing so, the property was knocked down to the Committee at a quarter to two o'clock, for the sum they had offered, amidst such cheers as the "mart" had never before echoed. The visitors' books of autographs, five in number, were then put up in one lot, and the offer of 50*l.* for them was made on behalf of the Committee, but they were ultimately bought for 73*l.* 10*s.* by Mr. Butler of Upper Clapton.

NOTES IN THE PROVINCES.

CONTRACTS are ready to be entered into for the erection of a spacious range of buildings at Woolwich for store-rooms, to be proceeded with immediately, on plans already prepared, with an estimated expenditure of 30,000*l.* The additional rooms and other buildings, forges, &c., for the studies of cadets in military and naval engineering, are partly built and partly in progress. Previous to the reinforcement of 4,000 artillerymen at the barracks also, the officers' present quarters are to be converted into accommodation for the men, and a spacious range of new buildings erected, from plans also prepared, for officers' quarters.

The new marine barracks which were to have been erected by the Admiralty at Gosport, have been stopped; it is said, by the Board of Ordnance, to whom the ground belonged, and from whom it would appear to have been taken on the very reasonable principle of 'what is yours is mine' but without the indispensable ceremonial of saying 'by your leave'; whereas the Ordnance department of this 'divided house' required it for fortification. Meantime, however, other obviously available points, it is said, have been left for years unfortified, although a deep trench was begun in partial prosecution of a plan proposed for the more complete protection of the dockyard and arsenal by a connection of the wall and bastions of Portsmouth and Portsmouth, where, says a Hampshire paper, "the most inexperienced eye can detect in a moment the very defenceless situation of this part of the garrison." Here, it is said, would be ample room for spacious marine barracks, such as those proposed, were the fortification completed, and the whole thus 'rendered almost invulnerable.'—The largest riding-school in England, excepting that in Bryanston-square, it is said, has just been completed at Southampton: length, 122 feet; breadth, 43 feet. The roof is in the style of that of Westminster Hall. The late manager of the Brighton school is the master.—The erection of a new poor-house for Southampton, say the local papers, seems now a settled certainty.—Complaints prevail of the state or nature of the water supplied to Southampton, partly from the Artesian well and partly from the Northam well. It is said to contain no less than 76 grs. per gallon of various chlorides, &c., and is to some constitutions a mild aperient. The evil may probably be temporary, and exhaust itself in time, as it has of late diminished.—The Roman Catholic chapel of St. Marie, at Rugby, was consecrated last week. The founder is a Pro-